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7590 03/23/2007  
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EXAMINER
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DOUGLAS, JOHN CHRISTOPHER

ART UNIT	PAPER NUMBER
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1764

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/23/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.



### DETAILED ACTION

Examiner acknowledges the response filed on 1/03/2007 containing remarks and a declaration by the inventor.

The rejection is maintained in part:

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
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1. Claims 1-3, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ross (US 4946656).
  2. With respect to claim 1, Ross discloses a fluid catalytic cracking process comprising:

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(a) cracking a hydrocarbon feed by contact with regenerated fluidized cracking catalyst in a riser reactor to produce a mixture of cracked hydrocarbons and spent catalyst containing coke and strippable hydrocarbons and discharging the mixture directly into a closed cyclonic separation means within a vessel (see Ross, column 4, lines 19-43 and column 6, lines 15-25 and Figure 1);

(b) cyclonically separating the mixture into a cracked hydrocarbon product with reduced catalyst content and a spent catalyst containing coke and strippable hydrocarbons (see Ross, column 4, lines 35-49 and column 6, lines 15-25 and Figure 1);

(c) discharging the spent catalyst down from the cyclonic separation into a catalyst stripper within the vessel with the stripper in open fluid communication with the vessel and with at least a majority of the stripper cross sectional area is open to the vessel (see Ross, column 5, lines 43-55 and column 6, lines 9-15 and Figure 1);

(d) stripping the spent catalyst by maintaining the spent catalyst as a dense phase fluidized bed fluidized by stripping steam into the lower portion of the bed to produce stripped hydrocarbons, which is discharged into the vessel and stripped catalyst which is discharged into a catalyst regenerator (see Ross, column 6, lines 9-45 and Figure 1);

(e) regenerating stripped catalyst in the regenerator at catalyst regeneration conditions to produce regenerated catalyst which is recycled to the cracking reactor (see Ross, column 1, lines 43-46 and column 4, lines 7-10 and it is inherent for catalyst

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regeneration to include contacting the stripped catalyst with an oxygen containing gas to burn the coke from the catalyst, see Chitnis (US 5681450), column 3, lines 63-67); and

(f) recovering the stripper vapor from the fluidized bed into a vertical conduit with an inlet above the fluidized bed and an outlet connected to the cyclonic separation means (see Ross, column 6, lines 30-42 and Figure 1).

Ross does not disclose where the stripper is in open fluid communication with the vessel and at least a majority of the stripper cross sectional area is open to the vessel. Instead, Ross discloses a stripper cap, which prevents the stripper from being in open fluid communication with the vessel (see Ross, column 6, lines 30-39 and Figure 1).

However, the omission of an element and its function is not obvious if the function of the element is not desired (see § MPEP 2144.04 II. A. citing *Ex Parte Wu*, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989).

In the instant case, the applicant omits the presence of a stripper cap because such a cap is not required to isolate the stripper (see Applicant's remarks, page 3). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Ross to exclude the presence of a stripper cap because it is not required.

3. With respect to claim 2, Ross discloses a primary cyclone attached to the riser by a conduit and cracked products and spent catalyst from the riser are sent to the primary cyclone via the conduit and the primary cyclone discharges spent catalyst down a dipleg and discharges vapor into a second cyclone which discharges spent catalyst down a second dipleg and vapor is discharged to downstream distillation (see Ross, column 4,

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lines 50-68) and a vertical conduit transfers stripper vapor from the stripper to the outlet of the primary cyclone (see Ross, column 6, lines 30-42).

4. With respect to claim 3, Ross discloses where the cracked hydrocarbons pass from the primary cyclone to the secondary cyclone without being added to the reactor vessel atmosphere and where the vertical conduit is attached to the inlet of the secondary cyclone and does not permit stripped hydrocarbons from entering the vessel atmosphere (see Ross, column 4, lines 65-68 and column 6, lines 30-42).

5. With respect to claim 9, Ross discloses where stripper vapor is discharged from the fluidized bed into the cyclone system through an inlet to the secondary cyclone (see Ross, column 6, lines 23-42 and Figure 1, where the vertical conduit outlet connects to the inlet of the second cyclone).

6. With respect to claim 7, Ross discloses where the outlet of the vertically extending transfer conduit is connected to an inlet of the secondary cyclone (see Ross, column 5, lines 1-6 and Figure 1, where the vertical conduit outlet connects to the inlet of the second cyclone).

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ross. Ross teaches everything in claim 2, but does not explicitly disclose where the outlet of the vertically extending transfer conduit is connected to an inlet of the primary separator. However, according to *In re Burhans*, 154 F.2d 690 (CCPA 1946), a selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results (see MPEP 2144.04 IV-C). In the instant case, the difference between claim 6 and the invention of Ross is the order of feeding the

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stripping vapor because claim 6 feeds the stripping vapor to the primary cyclone and Ross feeds the stripping vapor to the secondary cyclone. In addition, it would be expected by one having ordinary skill in the art to feed stripping vapor to the primary cyclone instead of the secondary cyclone so that the stripping vapor could be subjected to further separation. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Ross to change the order of adding stripping vapor in order to achieve the expected result of further separation.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ross in view of Lomas (US 5584985). Ross discloses everything in claim 1, but does not disclose where a purge gas stream is added at an elevation above the cyclone separation means in an amount equal to 0.5 to 10 mole % of the stripper vapor.

However, Lomas discloses passing a purge medium at the top of the separation vessel (see Lomas, column 3, lines 32-40 and column 7, lines 35-38 and Figure).

Lomas teaches that the purge medium is used to maintain a low hydrocarbon partial pressure to prevent the problem of coking (see Lomas, column 7, lines 25-34).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Ross to include passing a purge medium at the top of the separation vessel in order to maintain a low hydrocarbon partial pressure to prevent the problem of coking. Also, it would have been obvious to send purge material in an amount equal to 0.5 to 10 mole % of the stripper vapor because the amount of purge added is the amount that is used to maintain a low hydrocarbon partial pressure to prevent the problem of coking.

***Allowable Subject Matter***

9. Claims 10-13 are allowed.

10. The following is an examiner's statement of reasons for allowance: The prior art does not teach or disclose where the vertical conduit is physically attached to or within at least one of the primary cyclone diplegs.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

11. Claims 4 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach or disclose where at least a portion of the vertically extending transfer conduit is within the primary cyclone.

***Response to Arguments***

13. Applicant's arguments with respect to Chitnis have been fully considered and are persuasive. The rejection of claims 4, 5, and 10-13 has been withdrawn.

14. Applicant's argument with respect to Ross is not persuasive. Applicant argues that Ross requires a complicated device that creates many clearance and thermal



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expansion problems. Ross does not disclose where the stripper is in open fluid communication with the vessel and at least a majority of the stripper cross sectional area is open to the vessel. Instead, Ross discloses a stripper cap, which prevents the stripper from being in open fluid communication with the vessel (see Ross, column 6, lines 30-39 and Figure 1). However, the omission of an element and its function is not obvious if the function of the element is not desired (see § MPEP 2144.04 II. A. citing *Ex Parte Wu*, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989). The Applicant omits the presence of a stripper cap because such a cap is not desired due to the desirability of the stripper being in open fluid communication with the vessel (see Applicant's invention, claim 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Ross to exclude the presence of a stripper cap because it is not required.

15. Applicant's arguments with respect to Lomas are not persuasive. Applicant argues that Lomas teaches using vapor discharged from the cyclones as a stripping medium, which is the opposite approach of Owen. However, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Lomas is added to Ross to include the teaching of passing a purge medium at the top of the separation vessel (see Lomas, column 3, lines 32-40 and column 7, lines 35-38 and Figure). The purge medium is not the stripping medium (see Lomas, column 3, line 62 – column 4, line 7).


**Conclusion**

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C. Douglas whose telephone number is 571-272-1087. The examiner can normally be reached on 7:30 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


  
GLENN A. CALDAROLA  
PRIMARY EXAMINER  
GROUP 1 **DO**

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCD

3/16/07

  
GLENN A. CALDER  
PRIMARY EXAMINER  
TC GROUP 1700